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Cambridge Scientific Abstracts

Database: Ceramic Abstracts/World Ceramics Abstracts

Query: KW=(Aluminum Titanate)

Your Comments:

Record 1 of 129

TI: Title

Ceramic bodies based on aluminum titanate

AU: Author

Gugel, E; Schuster, P

SO: Source

Tonind.-Ztg. Keram. Rundsch., 98 (12): 315-18, 1974

AB: Abstract

A review of the crystal chemistry and properties of tialite ( $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ; beta approaches alpha-form at 1800 degrees C) refers especially to the large anisotropy in its thermal expansion, -2.5-, 11-, and 19 multiplied by  $10^{-6}$  for the a, b, and c axes, avg 9-10 multiplied by  $10^{-6}$ . The measured expansion of a polycrystalline fired specimen, however, is only 0.5-5 multiplied by  $10^{-6}$ . This difference is explained by the fact that during the cooling of the specimen, the expansion anisotropy causes microcracking (electron microscope) and when the specimen is reheated to measure expansion, the microcracks provide spaces which accommodate some of the expansion and cause hysteresis in the heating and cooling curves. These tialite bodies have no technical value because of their porosity and low mechanical strength. The addition of 15%  $\text{ZrSiO}_4$  stabilized the alpha-form and, depending on the firing schedule (1450-1700 degrees), gave a body with cone refractoriness of 34, expansion approximately 2 multiplied by  $10^{-6}$ , high strength (30 N/mm<sup>2</sup>), and a thermal shock resistance better than that of cordierite bodies. Although the body has microcracks (porosity), it may have value as a refractory. Moreover, it may be useful as a binder for SiC bricks to be used in blast furnaces, and also as an additive in stoneware to improve the resistance to alkaline solutions.

PY: Publication Year

1974

PT: Publication Type

Journal

CL: Classification

Refractories

SF: Subfile

Ceramic Abstracts  
AN: Accession Number  
CA5506575

Record 2 of 129

TI: Title  
Aluminum titanate ceramics  
SO: Source  
Taikabutsu, 27 (215): 520-27, 1975  
AB: Abstract  
Melting point, low thermal expansion, decomposition, etc. at 1500 degrees C are discussed. ZnO sub 2 and MgO dissolved in Al sub 2 O sub 3 multiplied by TiO sub 2 up to 2.5% and 1.5-2.0%, resp. Addition of ZnO sub 2, MgO, and SiO sub 2, increased strength.  
PY: Publication Year  
1975  
PT: Publication Type  
Journal  
CL: Classification  
Refractories  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA5605630

Record 3 of 129

TI: Title  
Aluminum titanate composition being stable at high temperature  
SO: Source  
Great Britain Patent 1543492  
NT: Notes  
Patent date: 4 Apr 1979  
AP: Patent Applicant  
Asahi Glass Co., Ltd.  
PN: Patent Number  
1543492  
PY: Publication Year  
1979  
PT: Publication Type  
Patent  
PC: Patent Country  
Great Britain  
DE: Descriptors  
electronics  
CL: Classification  
Electronics  
SF: Subfile  
Ceramic Abstracts

AN: Accession Number  
CA5900580

Record 4 of 129

TI: Title  
Aluminum titanate-mullite ceramic articles  
SO: Source  
US Patent 4483944  
NT: Notes  
Patent date: 20 Nov 1984  
IN: Inventor  
Day, John P; Lachman, Irwin M  
AP: Patent Applicant  
Corning Glass Works  
PN: Patent Number  
4483944  
LA: Language  
English  
PY: Publication Year  
1984  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors  
engineering materials; refractories; aluminum  
CL: Classification  
Refractories  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA6402235

Record 5 of 129

TI: Title  
Improvement of aluminum titanate ceramic  
SO: Source  
Sprechsaal, 118 [12] 1157-66, 1985  
AB: Abstract  
The review concerns the manufacture, properties, stabilization,  
and uses of AlTiO sub 3 ceramic. 89 refs.  
LA: Language  
German  
PY: Publication Year  
1985  
PT: Publication Type  
Journal  
DE: Descriptors

general; titanates; materials, engineering  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA6606517

Record 6 of 129

TI: Title  
Mechanism for increasing the strength of technical ceramics due to  
eutectoid disintegration of aluminum titanate  
AU: Author  
Shevchenko, VYa; Dabizha, AA; Dabizha, NA  
SO: Source  
Journal of the Australian Ceramic Society, 24 [2] 123-5, 1988  
AB: Abstract  
Strengths of Al sub 2 O sub 3 -TiO sub 2 ceramics with 20- 45 wt%  
TiO sub 2 increase < or = 6.5 times by annealing at 1100 degrees  
C. Heat treatment results in eutectoid decomposition.  
LA: Language  
English  
PY: Publication Year  
1988  
PT: Publication Type  
Journal  
DE: Descriptors  
aluminum titanate; annealing; strengthening; decomposition;  
microcracking; titanates; strength; materials, engineering  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA6907981

Record 9 of 129

TI: Title  
Aluminum titanate--a literature review: II, Engineering properties  
and thermal stability  
AU: Author  
Thomas, HAJ  
SO: Source  
British Ceramic Transactions and Journal, 88 [5] 184-90, 1989  
AB: Abstract  
Title describes article content. 33 refs.  
LA: Language  
English

PY: Publication Year

1989

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; physicomaterial properties; thermal properties; stability; strength; titanates; materials, engineering

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7006754

Record 10 of 129

TI: Title

Aluminum titanate--a literature review: III, Preparation of powders

AU: Author

Thomas, HAJ

SO: Source

British Ceramic Transactions and Journal, 88 [6] 229-33, 1989

AB: Abstract

Title describes article content. For part II#1, see Ceram.

Abstr.#1, 1991#1, 70 [5-6] 70-06754A.

LA: Language

English

PY: Publication Year

1989

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; powders; processing; analysis; titanates; powders

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7011660

Record 12 of 129

TI: Title

Decomposition of aluminum titanate solid solutions

AU: Author

Day, John P; Locker, Robert J

SO: Source

EnviCeram '88 (Special edition of CFI, Ceramic Forum

International), 4 [2] 127-42, 1989

AB: Abstract

(Special edition of FI, Ceramic Forum International#1) Max decomposition rate occurs at R1200#+C. Of the 13 materials tested as stabilizers, only Fe and Mg have a positive effect and Fe#72O#73 is the only true stabilizer of Al#72TiO#75 up to 1000 h of exposure over the entire temp. range. (meeting proceedings)

LA: Language

English

PY: Publication Year

1989

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; decomposition; stabilization; iron oxides; solutions, solid; titanates; decomposition

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7004124

Record 14 of 129

TI: Title

Joining of aluminum titanate with niobium [by hot pressing]

AU: Author

Wohlfromm, H; Pena, Pilar; Moya, Jose S

SO: Source

Euro-Ceramics, 3pp. 3.429-35, 1989

AB: Abstract

Several reactions take place during bonding involving partial decomposition of Al titanate and formation of Nb oxides. Bonding conditions have to be chosen in a way that prevents formation of Nb#72O#75, which is detrimental to bonding strength. (meeting proceedings)

LA: Language

English

PY: Publication Year

1989

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; niobium; joints; reactions; bonding; joining; nitrides; niobium

CL: Classification

Ceramic-metal systems

SF: Subfile

Ceramic Abstracts

AN: Accession Number  
CA7010346

Record 15 of 129

TI: Title

Microstructure development during the reaction sintering of  
alumina and titania to produce aluminum titanate

AU: Author

Thomas, HAJ

SO: Source

British Ceramic Proceedings, [No. 42] pp. 117-22, 1989

AB: Abstract

Sintering dilatometry together with optical and electron  
microscopy characterize microstructures and follow progress of the  
reaction process. Particular microstructural features are  
associated with the reaction to form Al titanate.

LA: Language

English

PY: Publication Year

1989

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; microstructure; sintering; reactions;  
microscopy; titanates; sintering; structure, micro-

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7004213

Record 16 of 129

TI: Title

Reaction-sintered aluminum titanate

AU: Author

Perera, DS

SO: Source

Journal of Materials Science, Lett., 8 [9] 1057-9, 1989

AB: Abstract

Mixtures were formed by adding 2 wt% BaO, Li<sub>2</sub>O, SnO<sub>2</sub>, or  
Na<sub>2</sub>O to equimolar mixtures of Al<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub>. Specimens  
were sintered in air at 1400°C for 4 h. Variable amounts of  
Al<sub>2</sub>TiO<sub>5</sub> were formed.

LA: Language

English

PY: Publication Year

1989



PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; additives; preparation; sintering; titanates;  
sintering

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7004257

Record 17 of 129

TI: Title

Strengthening of aluminum titanate by addition of zirconia and  
zirconium silicate

AU: Author

Pandolfelli, Victor C; Nettleship, I

SO: Source

British Ceramic Proceedings, [No. 42] pp. 109-15, 1989

AB: Abstract

Zr silicate and ZrO<sub>2</sub> additions improve mechanical properties while retaining good thermal properties of Al titanate. When sintered at 1500°C, the composition doped with Zr silicate shows no decrease in strength even after 25 thermal cycles. Zr silicate also improves b-Al<sub>2</sub>TiO<sub>3</sub> phase stability in samples aged for 168 h at 900°C. Glass phase at grain boundaries of the sample containing zircon indicates that improvement of final density is due to a liquid phase sintering mechanism.

LA: Language

English

PY: Publication Year

1989

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; additives; zirconium; mechanical properties;  
sintering; titanates; strengthening; additives

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7004280

Record 18 of 129

TI: Title

Thermomechanical properties of aluminum titanate ceramic between

20 and 1000#++3C

AU: Author

Freudenberg, B; Lindner, H-A

SO: Source

Euro-Ceramics, 2pp. 2.64-71, 1989

AB: Abstract

Several properties show hysteresis effects under thermal or mechanical cyclic load, a phenomenon attributed to the opening and closing of microcracks. Based on these data, the shrinkage stress acting on the port liner tube in a cast iron matrix is calculated.

Analysis shows Al titanate can withstand the compressive stresses. (meeting proceedings)

LA: Language

English

PY: Publication Year

1989

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; hysteresis; shrinkage; stress; microcracking; titanates; mechanical properties

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7009338

Record 19 of 129

TI: Title

Al sub 2 TiO sub 5 -ZrTiO sub 4 -ZrO sub 2 composites--a new family of low-thermal-expansion ceramics

AU: Author

Parker, Fred J

SO: Source

Journal of the American Ceramic Society, 73 [4] 929-32, 1990

AB: Abstract

These compositions give avg thermal expansions (  $\alpha$  sub / 24-1000 degrees C/ ) as low as  $-2 \times 10^{-6}$  degrees -sup 1 and excellent high-temp. stability. The low thermal expansion results by microcracking by the titanate phases and a contractive phase transformation by the ZrO sub 2 . Crystal chemistry and microstructure depend on processing. Although the composites represent a complex microcracking system, the above properties make them potential candidates for applications requiring thermal shock resistance.

LA: Language

English

PY: Publication Year

1990

PT: Publication Type

Journal

DE: Descriptors

composites; thermal expansion; zirconia; solid solutions; aluminum titanate; composites; expansion

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA6905776

Record 20 of 129

TI: Title

Aluminium titanate formation by solid-state reaction of Al sub 2 O sub 3 and TiO sub 2 single crystals

AU: Author

Freudenberg, B; Mocellin, A

SO: Source

Journal of Materials Science, 25 [8] 3701-8, 1990

AB: Abstract

Al sub 2 O sub 3 and TiO sub 2 reaction couples are prepared from polished prisms of sapphire and rutile single crystals with both c-axes normal to the common interface. Microstructures are analyzed after heat treatments in O sub 2 at 1690 and 1780 K, sometimes with a superimposed 20 K temp. difference across the rutile. Quantitative evaluation of the growth kinetics provides self-consistent estimates of effective diffusivities along the TiO sub 2 c-axis and across the titanate layer.

LA: Language

English

PY: Publication Year

1990

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; formation; solid state; reactions; single crystals

CL: Classification

Microstructure and characterization

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7103143

Record 21 of 129

TI: Title

Aluminum titanate ceramic sintered body  
SO: Source  
US Patent 5008222  
NT: Notes  
Patent date: 16 Apr 1991  
AP: Patent Applicant  
Toshiba Corp.  
PN: Patent Number  
5008222  
LA: Language  
English  
PY: Publication Year  
1990  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors  
aluminum titanate; magnesia; silica; titanates; sintering  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7011831

Record 22 of 129

TI: Title  
Corrosion of aluminum titanate ceramics in molten aluminum  
SO: Source  
Report of the Research Laboratory of Engineering Materials, Tokyo  
Institute of Technology, 15pp. 67-74, 1990  
AB: Abstract  
Al titanate is corroded by molten Al at 1000 degrees C in Ar atm.  
Ti ion in Al titanate is reduced by molten Al to metallic Ti and  
the Ti dissolves into molten Al. The reaction leaves corundum and  
Al in the reaction layer. This reaction is accompanied with a vol  
decrease of solid phases, which changes specimen size and the  
porous reaction layer of the product. The thickness of reaction  
layer is influenced by firing temp., not additives in the  
ceramics. Grain-boundary cracks lower corrosion resistance.  
LA: Language  
English  
PY: Publication Year  
1990  
PT: Publication Type  
Journal  
DE: Descriptors  
aluminum titanate; aluminum; corrosion resistance; corundum;

reactions; corrosion; titanates; aluminum  
CL: Classification  
Oxidation and corrosion  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7109401

Record 24 of 129

TI: Title  
Engine cylinder head with precombustion chambers using ceramic insert  
SO: Source  
US Patent 4899707  
NT: Notes  
Patent date: 13 Feb 1990  
AP: Patent Applicant  
NGK Spark Plug Co., Ltd.  
PN: Patent Number  
4899707  
LA: Language  
English  
PY: Publication Year  
1990  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors  
heat engine ceramics; cylinders; combustion; aluminum titanate; cordierite; materials, engineering; heat  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA6908060

Record 27 of 129

TI: Title  
Aluminum titanate powder synthesis via thermal decomposition of transparent gels  
AU: Author  
Mani, Themanam Veettil; Varma, Harikrishna; Warriar, Krishna G  
SO: Source  
Journal of the American Ceramic Society, 74 [8] 1807-10, 1991  
AB: Abstract  
The TGA curve of  $\text{AlTiO}_{0.73}$  precursor gel is characterized by a

decomposition temp. extending up to 800#C while the constituent gels of boehmite and hydrous TiO#72 independently decompose at lower temp. The gel stays in the amorphous state up to 800#+, as revealed from XRD. Sintered AlTiO#73 grains with sizes F2 mm are cracked while smaller ones are intact. When heated for a period of 2 h, the gel decomposes to powders with avg particle sizes of 2.7 mm at 900#+ and 6.5 mm at 1400#+.

LA: Language

English

PY: Publication Year

1991

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; gels; thermal decomposition; particle size; powders; titanates; powders; synthesis

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7009126

Record 28 of 129

TI: Title

Aluminum titanate preparation from nonreactive alumina

AU: Author

Aliprandi, G; Battilana, G; Nanni, R

SO: Source

Materials Science Monographs, 66 [B] 775-84, 1991

AB: Abstract

The reaction for AlTiO sub 5 formation is studied starting from commercial sandy Al sub 2 O sub 3 and rutile. Particle size distribution is determined. Firing is carried out for 10 h at 1450 degrees C. The effect of different firing atms is evaluated. Influences of operational parameters are discussed and final product chemical characteristics verified. (meeting proceedings)

LA: Language

English

PY: Publication Year

1991

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; alumina; reactions; preparation; characterization

CL: Classification

Processing science

SF: Subfile

Ceramic Abstracts  
AN: Accession Number  
CA7205339

Record 29 of 129

TI: Title  
Ceramic materials for use in insert-casting and processes for  
producing the same  
SO: Source  
US Patent 5066626  
NT: Notes  
Patent date: 19 Nov 1991  
AP: Patent Applicant  
NGK Insulators, Ltd.  
PN: Patent Number  
5066626  
LA: Language  
English  
PY: Publication Year  
1991  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors  
aluminum titanate; glass; casting; production processes  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7105303

Record 30 of 129

TI: Title  
Ceramic materials to be insert-cast  
SO: Source  
US Patent 5055435  
NT: Notes  
Patent date: 8 Oct 1991  
AP: Patent Applicant  
NGK Insulators, Ltd.  
PN: Patent Number  
5055435  
LA: Language  
English  
PY: Publication Year  
1991

## PT: Publication Type

Patent

## PC: Patent Country

US

## DE: Descriptors

aluminum titanate; casting; linings

## CL: Classification

Oxides

## SF: Subfile

Ceramic Abstracts

## AN: Accession Number

CA7105304

Record 31 of 129

## TI: Title

Characterization of beta -Al sub 2 TiO sub 5 aged at 1000 degrees  
C

## SO: Source

Materials Science Monographs, 66 [D] 2899-907, 1991

## AB: Abstract

Paper reports all experimental data such as mechanical properties,  
thermal expansion coeffs., thermal shock resistance, etc., and  
provides a correlation among all the characteristics of the  
material and decomposition level. (meeting proceedings)

## LA: Language

English

## PY: Publication Year

1991

## PT: Publication Type

Journal

## DE: Descriptors

aluminum titanate; aging; decomposition; mechanical properties;  
thermal properties

## CL: Classification

Oxides

## SF: Subfile

Ceramic Abstracts

## AN: Accession Number

CA7114697

Record 33 of 129

## TI: Title

Fabrication of flaw-tolerant aluminum-titanate-reinforced alumina

## AU: Author

Runyan, Julie L; Bennison, Stephen J

## SO: Source

Journal of the European Ceramic Society, 7 [2] 93-9, 1991

## AB: Abstract



High-density (99% theoretical) composites with controlled microstructures are produced using starting powders of  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> and  $\beta$ -AlTiO<sub>3</sub>. Indentation-strength measurements demonstrate flaw tolerance. Strong crack stabilization with prefailure extensions of a millimeter or more exists that gives rise to flaw-tolerance properties and results in pronounced R-curve behavior. Grain-localized crack bridging is active in these materials and may contribute to R-curve properties. 43 refs.

LA: Language

English

PY: Publication Year

1991

PT: Publication Type

Journal

DE: Descriptors

composites; aluminum titanate; fracture toughness; r-curve; mechanical properties

CL: Classification

Processing science

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7112244

Record 35 of 129

TI: Title

Flaw-insensitive ceramics

AU: Author

Bennison, Stephen J; Padture, Nitin, P; Runyan, Julie L

SO: Source

Philosophical Magazine Letters, 64 [4] 191-5, 1991

AB: Abstract

Authors propose processing ceramics with crack-impeding elements integrated into the indigenous microstructures, so that any preexisting or service-induced flaws are effectively stabilized. Strength data on a tailored Al<sub>2</sub>O<sub>3</sub>/AlTiO<sub>3</sub> material demonstrate the capacity of this approach to produce simple ceramics with unique flaw insensitivity.

LA: Language

English

PY: Publication Year

1991

PT: Publication Type

Journal

DE: Descriptors

composites; alumina; aluminum titanate; flaws; strength

CL: Classification

Processing science

SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7205445

Record 37 of 129

TI: Title  
High-resolution electron microscopy study of the cationic disorder  
in Al sub 2 TiO sub 5  
AU: Author  
Epicier, T; Thomas, G; Wohlfromm, H  
SO: Source  
Journal of Materials Research, 6 [1] 138-45, 1991  
AB: Abstract  
Crystallographic arrangement is studied, especially ordering  
possibilities of Al and Ti cations in the metallic sublattice.  
LA: Language  
English  
PY: Publication Year  
1991  
PT: Publication Type  
Journal  
DE: Descriptors  
aluminum titanate; cations; disorder; electron microscopy;  
crystallography  
CL: Classification  
Crystal chemistry, thermodynamics, phase  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7213557

Record 38 of 129

TI: Title  
Method for producing aluminum titanate  
SO: Source  
US Patent 5032376  
NT: Notes  
Patent date: 16 Jul 1991  
AP: Patent Applicant  
Maschinenfabrik Andritz AG  
PN: Patent Number  
5032376  
LA: Language  
English  
PY: Publication Year  
1991  
PT: Publication Type

Patent  
 PC: Patent Country  
 US  
 DE: Descriptors  
 aluminum titanate; production processes; powders  
 CL: Classification  
 Oxides  
 SF: Subfile  
 Ceramic Abstracts  
 AN: Accession Number  
 CA7102288

Record 39 of 129

TI: Title  
 Microstructural characterization of aluminum titanate-based composite materials  
 AU: Author  
 Wohlfromm, Hans; Epicier, Thierry; Moya, Jose S  
 SO: Source  
 Journal of the European Ceramic Society, 7 [6] 385-96, 1991  
 AB: Abstract  
 Authors study Al sub 2 TiO sub 5 , MgO-stabilized Al sub 2 TiO sub 5 , and Al sub 2 TiO sub 5 /mullite/ZrO sub 2 composites, stabilized and unstabilized. HREM shows complete disorder in cationic sublattice of Al sub 2 TiO sub 5 , even in presence of Mg. Analysis of Burgers vectors of dislocations in Al sub 2 TiO sub 5 is presented. EDXS analysis of Al sub 2 TiO sub 5 bulk in MgO-stabilized samples gives direct evidence for formation of solid solution of Al sub 2 sub ( sub 1 sub - sub x sub ) Mg sub x Ti sub 1 sub + sub x O sub 5 with improved thermal stability. TEM reveals presence of glassy phase in all samples. EDXS analysis of glassy phase shows repartition of Mg between Al sub 2 TiO sub 5 matrix and glass, reducing effectiveness of stabilizing MgO.  
 LA: Language  
 English  
 PY: Publication Year  
 1991  
 PT: Publication Type  
 Journal  
 DE: Descriptors  
 aluminum titanate; magnesia; zirconia; microstructure; characterization  
 CL: Classification  
 Microstructure and characterization  
 SF: Subfile  
 Ceramic Abstracts  
 AN: Accession Number  
 CA7202880

## Record 41 of 129

## TI: Title

Preparation of aluminum titanate by slip casting

## AU: Author

Wohlfromm, Hans; Pena, Pilar; Moya, Jose S

## SO: Source

Materials Science Monographs, 66 [B] 1083-94, 1991

## AB: Abstract

Zeta potential of Al sub 2 O sub 3 and TiO sub 2 as a function of pH and surfactant content is determined. Aqueous suspensions are prepared. Al sub 2 O sub 3 /TiO sub 2 samples are cast and heat-treated at > 1300 degrees C to obtain Al sub 2 TiO sub 5 .  
(meeting proceedings)

## LA: Language

English

## PY: Publication Year

1991

## PT: Publication Type

Journal

## DE: Descriptors

aluminum titanate; suspensions; zeta potential; slip casting; preparation

## CL: Classification

Processing science

## SF: Subfile

Ceramic Abstracts

## AN: Accession Number

CA7205574

## Record 42 of 129

## TI: Title

Preparation of aluminum titanate from an organometallic oligomer

## SO: Source

US Patent 5039636

## NT: Notes

Patent date: 13 Aug 1991

## AP: Patent Applicant

Hercules, Inc.

## PN: Patent Number

5039636

## LA: Language

English

## PY: Publication Year

1991

## PT: Publication Type

Patent

## PC: Patent Country

US

DE: Descriptors  
aluminum titanate; organometallic  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7102305

Record 43 of 129

TI: Title  
Sinterable pulverulent raw material based on aluminum titanate, a  
process for its preparation, and the sintered bodies produced  
therefrom and their use  
SO: Source  
US Patent 5055434  
NT: Notes  
Patent date: 8 Oct 1991  
AP: Patent Applicant  
Bayer AG  
PN: Patent Number  
5055434  
LA: Language  
English  
PY: Publication Year  
1991  
PT: Publication Type  
Patent  
PC: Patent Country  
US

DE: Descriptors  
aluminum titanate; high temperature; engines; catalysts  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7105347

Record 45 of 129

TI: Title  
Thermal stabilization of aluminum titanate and properties of  
aluminum titanate solid solutions  
AU: Author  
Tilloca, G  
SO: Source  
Journal of Materials Science, 26 [10] 2809-14, 1991  
AB: Abstract

Thermal stabilization of Al sub 2 TiO sub 5 , without altering its thermal expansion, is considered by partial substitution in the structure compound of Al sup 3 sup + ions by Fe sup 3 sup + ions. Solid solutions show a strong thermal stability and a thermal expansion coeff., especially for the solid solution (x=0.1), which is not far from the Al sub 2 TiO sub 5 value even after annealing for 300 h at 1000 degrees C.

LA: Language

English

PY: Publication Year

1991

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; solid solutions; stability; thermal expansion; iron

CL: Classification

Physical properties

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7202506

Record 48 of 129

TI: Title

Aluminum titanate ceramics: I, Influence of Al sub 2 O sub 3 on course of synthesis and on Al sub 2 TiO sub 5 microstructure

SO: Source

Sklar a Keramik, 42 [12] 404-8, 1992

AB: Abstract

Article abstract not included.

LA: Language

Czechoslovakian

PY: Publication Year

1992

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; alumina; microstructure; synthesis; scanning electron microscopy [sem]

CL: Classification

Processing science

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7305689

Record 56 of 129

TI: Title  
Process for producing sintered material based on aluminum oxide  
and titanium oxide  
SO: Source  
US Patent 5076815  
NT: Notes  
Patent date: 31 Dec 1991  
AP: Patent Applicant  
Lonza Ltd.  
PN: Patent Number  
5076815  
LA: Language  
English  
PY: Publication Year  
1992  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors  
alumina; titania; sintering; aluminum titanate; abrasives  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7111691

Record 57 of 129

TI: Title  
Sintered ceramic materials based on aluminum titanate, a process  
for their production, and their use  
SO: Source  
US Patent 5153153  
NT: Notes  
Patent date: 6 Oct 1992  
AP: Patent Applicant  
Bayer AG  
PN: Patent Number  
5153153  
LA: Language  
English  
PY: Publication Year  
1992  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors

aluminum titanate; mullite  
 CL: Classification  
 Oxides  
 SF: Subfile  
 Ceramic Abstracts  
 AN: Accession Number  
 CA7204889

Record 60 of 129

TI: Title  
 Al sub 2 TiO sub 5 -Al sub 2 O sub 3 functionally gradient  
 materials obtained by sequential slip casting  
 AU: Author  
 Requena, J; Moya, JS; Pena, P  
 SO: Source  
 Ceramic Transactions, 34pp. 203-10, 1993  
 AB: Abstract  
 Slurries are prepared with 65% solids content and viscosities of  
 8- 17 MPa center dot s. Morphology of the different  
 reaction-sintered layers depends on the heating cycles. Cracks  
 perpendicular to FGM layers are attributed to the expansive  
 formation of Al sub 2 TiO sub 5 . (meeting proceedings)  
 LA: Language  
 English  
 PY: Publication Year  
 1993  
 PT: Publication Type  
 Journal  
 DE: Descriptors  
 functionally gradient materials; aluminum titanate; alumina; slip  
 casting; morphology  
 CL: Classification  
 Processing science  
 SF: Subfile  
 Ceramic Abstracts  
 AN: Accession Number  
 CA7213852

Record 70 of 129

TI: Title  
 Synthesis and properties of Al sub 2 TiO sub 5 ceramics  
 AU: Author  
 Jambazov, S; Lepkova, D  
 SO: Source  
 Third Euro-Ceram., 3, pp. 1013-18, 1993  
 AB: Abstract  
 Al sub 2 TiO sub 5 is synthesized using the solid phase method and  
 sol-gel techniques. In addition, thialyte ceramics with the



participation of different additives are also synthesized. The influence of these additives on the process of thialyte formation, its stability, and physicomechanical and thermal properties are verified. (meeting proceedings)

LA: Language

English

PY: Publication Year

1993

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; synthesis; mechanical properties; sol-gel; thermal properties

CL: Classification

Ferroelectrics

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA74064

Record 72 of 129

TI: Title

Use of polyfactor experimental design for creation of a porous structure of ceramic biomaterial based on Al sub 2 TiO sub 5

AU: Author

Spaseska, D; Milosevski, M; Milosevska, R

SO: Source

Third Euro-Ceram., 3, pp. 107-12, 1993

AB: Abstract

High-porosity, controlled pore size, shape and their orientation, as well as good strength and E-modulus, are significant characteristics of a suitable bioceramic system. C fiber bundles, previously infiltrated into the ceramic matrix, are fired out during sintering for the purpose of the creation of a porous structure of bioceramics with defined characteristics. (meeting proceedings)

LA: Language

English

PY: Publication Year

1993

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; porous materials; mechanical properties; carbon fibers

CL: Classification

Nonoxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number  
CA7407028

Record 73 of 129

TI: Title  
Aluminum titanate ceramic and process for producing the same  
SO: Source  
US Patent 5346870  
NT: Notes  
Patent date: 13 Sep 1994  
AP: Patent Applicant  
NGK Insulators, Ltd.  
PN: Patent Number  
5346870  
PY: Publication Year  
1994  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors  
aluminum titanate; mullite; production processes  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7401248

Record 76 of 129

TI: Title  
Ceramics based on aluminum titanate, process for their production,  
and their use  
SO: Source  
US Patent 5288672  
NT: Notes  
Patent date: 22 Feb 1994  
AP: Patent Applicant  
Bayer AG  
PN: Patent Number  
5288672  
PY: Publication Year  
1994  
PT: Publication Type  
Patent  
PC: Patent Country  
US  
DE: Descriptors

aluminum titanate; mullite; production processes  
 CL: Classification  
   Oxides  
 SF: Subfile  
   Ceramic Abstracts  
 AN: Accession Number  
   CA7312351

Record 81 of 129

TI: Title  
   Method of producing self-supporting aluminum titanate composites  
   and products relating thereto  
 SO: Source  
   US Patent 5340783  
 NT: Notes  
   Patent date: 23 Aug 1994  
 IN: Inventor  
   Anderson, Edward N; Johnson, Thomas A  
 AP: Patent Applicant  
   Lanxide Technology Co., LP  
 PN: Patent Number  
   5340783  
 PY: Publication Year  
   1994  
 PT: Publication Type  
   Patent  
 PC: Patent Country  
   US  
 DE: Descriptors  
   aluminum titanate; composites  
 CL: Classification  
   Nonoxides  
 SF: Subfile  
   Ceramic Abstracts  
 AN: Accession Number  
   CA7401326

Record 82 of 129

TI: Title  
   Microstructures and mechanical properties of TiO sub 2 -doped  
   alumina ceramics owing to decomposition of formed Al sub 2 TiO sub  
   5  
 SO: Source  
   J. Ceramic Soc. Jpn., 102 [3] 252-7, 1994  
 AB: Abstract  
   Al sub 2 TiO sub 5 decomposed into Al sub 2 O sub 3 and TiO sub 2  
   at 900-1300 degrees C. Al sub 2 O sub 3 powder compacts containing  
   0-16 wt% TiO sub 2 were sintered at 1500 degrees C for 2 h, then

annealed at 900-1350 degrees in air. Thermal stress existed in the sintered body due to difference in thermal expansion coeff. between Al sub 2 O sub 3 and TiO sub 2 . Bending strength was increased by decomposition of Al sub 2 TiO sub 5 , but toughness was not changed.

LA: Language

Japanese

PY: Publication Year

1994

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; microstructure; decomposition; mechanical properties; dopants/doping

CL: Classification

Microstructure and characterization

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7317173

Record 83 of 129

TI: Title

Overview of the thermal shock characteristics of aluminum titanate

AU: Author

Alecu, I; Stead, RJ; Perera, DS

SO: Source

Int. Ceram. Monogr., 1 [2] 868-73, 1994

AB: Abstract

Title describes article content. (meeting proceedings)

LA: Language

English

PY: Publication Year

1994

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; thermal shock resistance; microstructure; applications

CL: Classification

Deformation, strength, fracture

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7502083

Record 85 of 129

TI: Title

Sinterability of Al sub 2 TiO sub 5 powder synthesized by homogeneous precipitation technique

SO: Source

J. Ceramic Soc. Jpn., 102 [3] 309-11, 1994

AB: Abstract

Calcined powders were sintered at 1350-1500 degrees C for 4 h. Sintered density increased and amount of Al sub 2 TiO sub 5 formed decreased by increasing calcination temp. between 800 degrees and 1000 degrees. In sintering of a powder calcined at 1350 degrees, sintered density and Al sub 2 TiO sub 5 amount increased with increase in sintering temp., resulting in 96% TD and 100% Al sub 2 TiO sub 5 phase by sintering at 1500 degrees.

LA: Language

Japanese

PY: Publication Year

1994

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; powders; sinter/sintering; calciners  
/calcination; synthesis

CL: Classification

Processing science

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7316990

Record 86 of 129

TI: Title

Synthesis and properties of tialite, beta-Al sub 2 TiO sub 5

AU: Author

Sekar, MMA; Patil, KC

SO: Source

Br. Ceram. Trans., 93 [4] 146-9, 1994

AB: Abstract

Tialite, a low-expansion material, was synthesized by the combustion of corresponding metal nitrates and carbohydrate or urea mixtures at 500 degrees C.

LA: Language

English

PY: Publication Year

1994

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; synthesis; thermal expansion; physical  
properties

CL: Classification

Processing science  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7501704

Record 87 of 129

TI: Title  
Application of aluminum titanate as thermocouple protection tubes  
in the molten aluminum industry  
SO: Source  
Ceramic Transactions, 52, pp. 247-54, 1995  
AB: Abstract  
The mechanical and physical properties of aluminum titanate  
(AT-80) are evaluated, and theoretical calculations as well as  
empirical data are presented showing its response time. (meeting  
proceedings)  
LA: Language  
English  
PY: Publication Year  
1995  
PT: Publication Type  
Journal  
DE: Descriptors  
aluminum titanate; thermocouples; mechanical properties; thermal  
expansion  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA7501075

Record 88 of 129

TI: Title  
Microwave synthesis of aluminum titanate in air and nitrogen  
AU: Author  
Mathis, MD; Agrawal, Dinesh K; Roy, Rustum; Plovnick, Ross H;  
Hutcheon, RM  
SO: Source  
Ceramic Transactions, 59, pp. 557-64, 1995  
AB: Abstract  
Microwave-assisted solid-state reaction of Al sub 2 O sub 3 and  
anatase to form Al sub 2 TiO sub 5 was studied. Al sub 2 TiO sub 5  
could be synthesized at 1150 degrees C in air and at 1050 degrees  
in N sub 2 . Dielectric studies showed a threefold increase in the  
dielectric constant when processed in N sub 2 as opposed to air,  
indicating the evolution of defects, and showed that the onset of

the solid-state reaction was enhanced with N sub 2 processing. Anatase was converted to rutile before the Al sub 2 TiO sub 5 reaction occurred, and Al sub 2 TiO sub 5 was synthesized from an Al sub 2 O sub 3 -defect rutile route in N sub 2 . Al sub 2 TiO sub 5 was nucleated at 600 degrees and was about 70% reacted by 900 degrees . (meeting proceedings)

LA: Language

English

PY: Publication Year

1995

PT: Publication Type

Journal

DE: Descriptors

aluminum titanate; synthesis; microwaves; air; nitrogen

CL: Classification

Processing science

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7501583

Record 89 of 129

TI: Title

Sol-gel .beta.-aluminum titanate thin film coating

SO: Source

US Patent 5407479

NT: Notes

Patent date: 18 Apr 1995

IN: Inventor

Sun, Tawei; Brown, Nancy R; Brown, Jesse J, Jr

AP: Patent Applicant

The Center for Innovative Technology; Virginia Polytechnic  
Institute & State University

PN: Patent Number

5407479

PY: Publication Year

1995

PT: Publication Type

Patent

PC: Patent Country

US

DE: Descriptors

aluminum titanate; thin films; coatings; sol-gel

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7409840

## Record 95 of 129

## TI: Title

Effects of excess alumina on microstructure of aluminum titanate ceramics made from a mixture of alumina and titania

## SO: Source

Yogyo Kyokaishi, 93 [6] 315-21, 1985

## LA: Language

Japanese

## PY: Publication Year

1985

## PT: Publication Type

Journal

## DE: Descriptors

chemistry; titanates; structure, micro-

## CL: Classification

Oxides

## SF: Subfile

Ceramic Abstracts

## AN: Accession Number

CA6608308

## Record 96 of 129

## TI: Title

Formation and decomposition of aluminum titanate: I, The reaction of formation of aluminum titanate

## AU: Author

Hennicke, Hans Walter; Lingenberg, W

## SO: Source

CFI, Ceramic Forum International/Berichte der Deutschen Keramischen Gesellschaft, 62 [9-10] 439-45, 1985

## AB: Abstract

Thermodynamic calculations show theoretically that  $\text{Al}_2\text{TiO}_5$  forms over the entire temp. range. However, the reaction proceeds at a noticeable rate only at 1260 degrees C. Tialite nuclei occur in samples tempered for 2 h at 1260 degrees . Since the reaction is solid state, it is unlikely that  $\text{Al}_2\text{TiO}_5$  forms below the decomposition zone (800- 1200 degrees ), in which tialite breaks down into rutile and corundum. XRD detected a small amount of tialite after 2 h at 1275 degrees ; dilatometry detected an incipient reaction > 1275 degrees . Increased porosity and pronounced grain growth lead to microcrack formation, reducing the mechanical strength of fired  $\text{Al}_2\text{TiO}_5$  .

## LA: Language

German | English

## PY: Publication Year

1985



PT: Publication Type  
Journal  
DE: Descriptors  
physics; titanates; formation; decomposition  
CL: Classification  
Oxides  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA6606501

Record 98 of 129

TI: Title  
Synthesis and thermal stability of aluminum titanate solid solutions  
SO: Source  
Journal of the American Ceramic Society, 70 [2] 69-71, 1987  
AB: Abstract  
The authors synthesized solid solutions of Al titanate by adding MgO, ZrO<sub>2</sub>, or SiO<sub>2</sub>, by reaction sintering, and by annealing in air. Substitution of Si for Al in Al<sub>2</sub>TiO<sub>5</sub> and of Ti and Mg ions for 2Al formed other solid solutions and effectively controlled thermal decomposition. Substitution of Zr for Ti had little effect.  
LA: Language  
English  
PY: Publication Year  
1987  
PT: Publication Type  
Journal  
DE: Descriptors  
oxides; solutions, solid; titanates; stability  
CL: Classification  
Chemistry  
SF: Subfile  
Ceramic Abstracts  
AN: Accession Number  
CA6603180

Record 99 of 129

TI: Title  
Correlation between grain size and thermal expansion for aluminum titanate materials  
AU: Author  
Parker, Fred J; Rice, Roy W  
SO: Source  
Journal of the American Ceramic Society, 72 [12] 2364-6, 1989

## AB: Abstract

An Al sub 2 TiO sub 5 avg grain size of 3- 4 mu m was the min. at which the size and population of microcracks effectively reduced apparent thermal expansion. Further increases in grain size resulted in a rapid drop in the bulk thermal expansion, followed by diminishing decreases with further increases in grain size.

## LA: Language

English

## PY: Publication Year

1989

## PT: Publication Type

Journal

## DE: Descriptors

titanates; thermal expansion; grain size; microcracking;  
titanates; expansion

## CL: Classification

Oxides

## SF: Subfile

Ceramic Abstracts

## AN: Accession Number

CA6901340

Record 100 of 129

## TI: Title

Mechanism of technical ceramic strength increase as a result of eutectoid decomposition of aluminum titanate

## AU: Author

Zhavoronkov, NM; Shevchenko, VYa; Dabizha, AA

## SO: Source

Doklady Akademii Nauk SSSR, 304 [3] 673-5, 1989

## AB: Abstract

Ultimate flexural strength and apparent density increase in Al#72O#73-Al#72TiO#73 ceramics with 55#8#.80% Al#72O#73 upon annealing at 1100#+C, due to eutectoid decomposition that increases with the duration of annealing. Results indicate a close-grained structure (rutile) forms.

## LA: Language

Russian

## PY: Publication Year

1989

## PT: Publication Type

Journal

## DE: Descriptors

titanates; alumina; flexural strength; decomposition; annealing;  
titanates; decomposition; strength

## CL: Classification

Oxides

## SF: Subfile

Ceramic Abstracts

AN: Accession Number  
CA7001551

Record 102 of 129

TI: Title  
Aluminum titanate made in a solar furnace

AU: Author  
Azimov, SA; Gulamova, DD; Mel'nik, NN

SO: Source  
Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy, 20 [3]  
469-71, 1984

AB: Abstract  
beta -Al sub 2 TiO sub 5 forms during synthesis of Al sub 2 TiO sub 5 in a melt of TiO sub 2 and Al sub 2 O sub 3 . Study using Raman spectroscopy determined crystal lattice parameters and details of the synthesis process.

LA: Language  
Russian

PY: Publication Year  
1984

PT: Publication Type  
Journal

DE: Descriptors  
chemistry; aluminum; furnaces; titanates

CL: Classification  
Engineering materials

SF: Subfile  
Ceramic Abstracts

AN: Accession Number  
CA6405512

Record 103 of 129

TI: Title  
Aluminum titanate formation by solid-state reaction of fine Al sub 2 O sub 3 and TiO sub 2 powders

SO: Source  
Journal of the American Ceramic Society, 70 [1] 33-8, 1987

AB: Abstract  
The free energy of formation of Al sub 2 TiO sub 5 in equimolar Al sub 2 O sub 3 sub - TiO sub 2 powder mixtures of approximately 1- mu m particle sizes and approximately 99.8 wt% purity is small at approximately 1300 degrees C. Different mechanisms operate depending on the reaction stage--the rapid initial reaction stage is the nucleation-growth of Al sub 2 TiO sub 5 cells in a nonreacting matrix. The final stage is the slow diffusion-controlled elimination of Al sub 2 O sub 3 and TiO sub 2 dispersoids trapped during the growth of the initial Al sub 2 TiO

sub 5 cells. 34 refs.  
 LA: Language  
 English  
 PY: Publication Year  
 1987  
 PT: Publication Type  
 Journal  
 DE: Descriptors  
 chemistry; aluminum; powders; reactions  
 CL: Classification  
 Oxides  
 SF: Subfile  
 Ceramic Abstracts  
 AN: Accession Number  
 CA6602765

Record 107 of 129

TI: Title  
 Microstructure and bending strength of aluminum titanate ceramic prepared from a mixture of alumina and titania  
 SO: Source  
 Yogyo Kyokaishi, 91 [2] 94-101, 1983  
 AB: Abstract  
 The bending strength of the specimens was  $< 140 \text{ kgf/cm}^2$ . All bodies consisted of large domains, in which Al titanate grains 3-4  $\mu\text{m}$  diam. were oriented. Large thermal expansion anisotropy caused severe domain boundary cracks which decreased strength of the fired specimens. Rapid heating or addition of small amounts of synthesized Al titanate powder decreased crack size, increasing mechanical strength. Mechanism of domain structure formation is discussed.  
 LA: Language  
 Japanese  
 PY: Publication Year  
 1983  
 PT: Publication Type  
 Journal  
 DE: Descriptors  
 aluminum; strength; structure, micro-  
 CL: Classification  
 Electronics  
 SF: Subfile  
 Ceramic Abstracts  
 AN: Accession Number  
 CA6304339

Record 108 of 129

## TI: Title

Microstructure and mechanical strength of aluminum titanate ceramics prepared from synthesized powders

## SO: Source

Yogyo Kyokaishi, 91 [6] 289-97, 1983

## AB: Abstract

Fired bodies of Al titanate ceramics, prepared from 3 synthesized powders having several grain sizes, showed domain-free structures. If the titanate grains were  $\geq 3 \mu\text{m}$ , then the bodies had many microcracks on the grain boundaries; if they were  $< 2.5 \mu\text{m}$ , there were few cracks. Bending strength of the fired bodies increased markedly with decrease of the grain size of the titanate, up to a max value of  $860 \text{ kgf/cm}^2$ . Thermal expansion of these fired bodies at  $1000^\circ\text{C}$  was  $< 0.4\%$ .

## LA: Language

Japanese

## PY: Publication Year

1983

## PT: Publication Type

Journal

## DE: Descriptors

electronics; whiteware; aluminum; strength

## CL: Classification

Whiteware

## SF: Subfile

Ceramic Abstracts

## AN: Accession Number

CA6306649

Record 109 of 129

## TI: Title

Crack propagation resistance of aluminum titanate ceramics

## SO: Source

International Journal of High Technology Ceramics, 1 [2] 129-37, 1985

## AB: Abstract

Specimens fired at  $1450^\circ\text{C}$  and  $1500^\circ\text{C}$  contain grain boundary microcracks which decrease bend strength and Young's modulus. At the propagation of a crack, microcracks deflect and cause crack branching and blunt the crack tip. As a result, work of fracture increases  $> 2$  multiplied by the original value and crack propagation velocity decreases to  $1/2000$  of that in microcrack-free specimens.

## LA: Language

English

## PY: Publication Year

1985

## PT: Publication Type

Journal  
DE: Descriptors  
  titanates; aluminum; cracks; strength; young's modulus; aluminum;  
  titanates; cracks  
CL: Classification  
  Physics  
SF: Subfile  
  Ceramic Abstracts  
AN: Accession Number  
  CA6703651

Record 111 of 129

TI: Title  
  Thermal and mechanical properties of aluminum titanate  
  [AT]-mullite composites: I, Effects of composition  
SO: Source  
  Yogyo Kyokaishi, 94 [9] 970-6, 1986  
AB: Abstract  
  Avg linear thermal expansion coeff. from 100- 1100 degrees C  
  increases slightly with increasing amount of AT to 50 wt%. The  
  degree of thermal expansion hysteresis decreases with decreasing  
  amount of AT. Bending strength of the composites containing 10- 30  
  wt% AT is highest, decreasing with additional AT.  
LA: Language  
  Japanese  
PY: Publication Year  
  1986  
PT: Publication Type  
  Journal  
DE: Descriptors  
  titanates; aluminum; mullite; composites; thermomechanical  
  properties; mechanical properties; composites; thermal properties  
CL: Classification  
  Oxides  
SF: Subfile  
  Ceramic Abstracts  
AN: Accession Number  
  CA6706865

Record 112 of 129

TI: Title  
  Thermal and mechanical properties of aluminum titanate  
  [AT]-mullite composites: II, Thermal shock resistance  
SO: Source  
  Yogyo Kyokaishi, 94 [11] 1190-2, 1986  
AB: Abstract

DELTA T sub / c/ of the AT-mullite, fired at 1520 degrees C for 4 h, remains constant with increasing amount of AT up to 30 wt%. At 50 wt% DELTA T sub / c/ increases, reaching 1050 degrees at 85 wt% AT. The bending strength is approximately 60 MPa.

LA: Language

Japanese

PY: Publication Year

1986

PT: Publication Type

Journal

DE: Descriptors

titanates; aluminum; mullite; composites; thermomechanical properties; mechanical properties; composites; thermal properties

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA6706866

Record 114 of 129

TI: Title

Grain-boundary microcracking due to thermal expansion anisotropy in aluminum titanate ceramics

SO: Source

Journal of the American Ceramic Society, 70 [8] C184-6, 1987

AB: Abstract

The authors determined microcracking temp. by measuring thermal contraction and expansion, accompanied by acoustic emission. In ceramics cooled at 6 degrees C/min, stress relaxation does not occur below the 1500 degrees sintering temp. The relation between the temp. difference from the sintering to the microcracking temp. and the grain size shows good agreement with the prediction based on the energy criterion of grain-boundary microcracking.

LA: Language

English

PY: Publication Year

1987

PT: Publication Type

Journal

DE: Descriptors

titanates; aluminum; cracking; grain boundaries; anisotropy; titanates; anisotropy; cracking

CL: Classification

Physics

SF: Subfile

Ceramic Abstracts

AN: Accession Number  
CA67018

Record 117 of 129

TI: Title  
Toughening aluminum titanate refractories

AU: Author  
Pandolfelli, Victor C

SO: Source  
Ceramica (Sao Paulo), 33 [214] 225-30, 1987

AB: Abstract  
Sintering four inorganic additives with Al sub 2 TiO sub 5 takes place at 1350- 1580 degrees C. Measurement of modulus of rupture, thermal shock resistance, pore size distribution, and thermal expansion coeff. shows the influence of these additives on mechanical and thermal shock resistance. Authors also consider the effect of additives on beta -Al sub 2 TiO sub 5 phase stability.

LA: Language  
Portugese

PY: Publication Year  
1987

PT: Publication Type  
Journal

DE: Descriptors  
titanates; aluminum; toughness; refractories; stability;  
refractories; titanates; strengthening

CL: Classification  
Refractories

SF: Subfile  
Ceramic Abstracts

AN: Accession Number  
CA6802804

Record 118 of 129

TI: Title  
Aluminum titanate formation by solid-state reaction of coarse Al sub 2 O sub 3 and TiO sub 2 powders

AU: Author  
Freudenberg, B

SO: Source  
Journal of the American Ceramic Society, 71 [1] 22-8, 1988

AB: Abstract  
At < or = 1600 K, Al sub 2 TiO sub 5 nucleation is hindered by the strain energy contribution. Metastable layer sequences Al sub 2 TiO sub 5 /TiO sub 2 /Al sub 2 O sub 3 occur during subsequent growth. High Al mobility in TiO sub 2 provides rapid Al transport from the metastable Al sub 2 O sub 3 /TiO sub 2 interface to the TiO sub 2 /Al sub 2 TiO sub 5 front. At > 1700 K the Al sub 2 O



sub 3 /TiO sub 2 interface is rapidly sealed off by Al sub 2 TiO sub 5 formation. Reactant transport across the Al sub 2 TiO sub 5 is slow because of low mobilities in the product phase. 31 refs.

LA: Language

English

PY: Publication Year

1988

PT: Publication Type

Journal

DE: Descriptors

titanates; aluminum; formation; solid state; powders; titanates; powders; formation

CL: Classification

Chemistry

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA6703565

Record 119 of 129

TI: Title

Aluminum titanate powders--characteristics and possible applications.

AU: Author

Rehfeld, Gerhard; Staudt, T; Zografou, C

SO: Source

Ceramic Transactions, 1Bpp: 1100-7, 1988

AB: Abstract

Discussion of powders synthesized by electrofusion covers microstructures of sintered specimens, prepared by different forming methods, and application of powders for thermal coating processes.

LA: Language

English

PY: Publication Year

1988

PT: Publication Type

Journal

DE: Descriptors

titanates; aluminum; powders; fusion; thermal properties; powders; aluminum; thermal properties

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA6803464

Record 120 of 129

## TI: Title

Crack healing and bending strength of aluminum titanate ceramics  
at high temperature

## SO: Source

Journal of the American Ceramic Society, 71 [5] C232-3, 1988

## AB: Abstract

Bending strength increased from 62 at RT to 280 MPa at 1100  
degrees C. Young's modulus also increased to 99 GPa at 1100  
degrees . Crack cylinderization at 1000- 1100 degrees markedly  
increased the mechanical strength. Thermal-hysteresis curves also  
showed healing of grain-boundary cracks.

## LA: Language

English

## PY: Publication Year

1988

## PT: Publication Type

Journal

## DE: Descriptors

titanates; aluminum; bending; young's modulus; high temperature;  
titanates; cracks; strength

## CL: Classification

Dielectrics

## SF: Subfile

Ceramic Abstracts

## AN: Accession Number

CA6706020

Record 121 of 129

## TI: Title

Reaction sintering studies on aluminum titanate

## AU: Author

Thomas, HAJ

## SO: Source

Science of Ceramics 14, pp. 273-8, 1988

## AB: Abstract

Title describes article content. (meeting proceedings)

## LA: Language

English

## PY: Publication Year

1988

## PT: Publication Type

Journal

## DE: Descriptors

titanates; aluminum; sintering; microstructure; phases; aluminum;  
titanates; sintering

## CL: Classification

Physics

## SF: Subfile

Ceramic Abstracts  
AN: Accession Number  
CA6805927

Record 122 of 129

TI: Title

Thermal durability of aluminum titanate ceramics prepared from  
electrofused powders

AU: Author

Zografou, C; Dhupia, GS; Kroenert, W

SO: Source

Science of Ceramics 14, pp. 757-62, 1988

AB: Abstract

Study of sintered bodies subjected to cyclic thermal shock at 750-  
1400 degrees C for 100 h or annealing at 1100 degrees for 100 h  
shows the microstructural degradation using SEM, XRD, and X-ray  
microanalysis.

LA: Language

English

PY: Publication Year

1988

PT: Publication Type

Journal

DE: Descriptors

titanates; aluminum; thermal shock; annealing; microstructure;  
titanates; thermal properties; powders

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA6805395

Record 123 of 129

TI: Title

Thermal expansion characterization and thermal stability of  
aluminum titanate

AU: Author

Byrne, WP; Morrell, R; Lawson, J

SO: Source

Science of Ceramics 14, pp. 775-80, 1988

AB: Abstract

Thermal expansion hysteresis becomes significant at > 600 degrees  
C, and dissociation of Al titanate into its component oxides  
becomes significant at > 1050 degrees . During prolonged heat  
treatment, dissociation occurs fastest at 1050- 1100 degrees ,  
causing increases in expansion coeff. and a reduction in  
dimensions. The degradation is reversible on refiring to high

temp. stability tests from a composition containing  
both MgO and SiO<sub>2</sub>. (meeting proceedings)

LA: Language

English

PY: Publication Year

1988

PT: Publication Type

Journal

DE: Descriptors

titanates; aluminum; thermal expansion; temperature; additives;  
thermal properties; titanates; expansion

CL: Classification

Oxides

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA6805396

Record 124 of 129

TI: Title

Ceramic materials containing aluminum titanate

SO: Source

Great Britain Patent 2203141

NT: Notes

Patent date: 12 Oct 1988

IN: Inventor

Olapinski, DH; Burger, DW; Dworak, DU

AP: Patent Applicant

Feldmuhle AG

PN: Patent Number

2203141

LA: Language

English

PY: Publication Year

1989

PT: Publication Type

Patent

PC: Patent Country

Great Britain

DE: Descriptors

titanates; aluminum; composition; fabrication; titanates; ceramic  
materials; aluminum

CL: Classification

Ferroelectrics

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA6804851

TI: Title

Effect of the microstructural features on the stability of  
aluminum titanate

AU: Author

Gulamova, DD; Sarkisova, MKh

SO: Source

Refractories (English Translation), 32 [5-6] 215-18, 1991

AB: Abstract

Article abstract not included.

LA: Language

English

PY: Publication Year

1991

PT: Publication Type

Journal

DE: Descriptors

titanates; aluminum; stability; microstructure; temperature

CL: Classification

Microstructure and characterization

SF: Subfile

Ceramic Abstracts

AN: Accession Number

CA7303139